

REMARKS

Claims 1-20 were pending in the application. Claims 1-10, 12-16 and 18-20 have been amended. None of the amendments contained herein narrow the claims for a reason related to patentability. In many cases, they merely claim that which was already inherent in the claims. In other cases, the amendments have the effect of broadening the claims. To the extent that a particular amendment has the effect of narrowing a claim, such amendment was not made for a reason relating to patentability because there is no outstanding office action.

New claims 21-30 have been added in order to more fully claim what Applicants regard as their invention. Support for these claims is found in the originally filed claims and in Figures 1-5 and the accompanying discussion in the specification.

In the event that the Examiner has any questions or concerns regarding this amendment, the Examiner is respectfully requested to initiate a telephonic interview with the undersigned attorney.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

Dated this 19<sup>th</sup> day of April 2002.

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Claims 1-20 have been amended as follows:

1. (Amended) An optical device for focusing light emitted from a light-generating source of a dental instrument, the optical device comprising:

a lens having a first end that is substantially flat and a second end that is curved, wherein the substantially flat first end is configured for receiving light from the light-generating source, and wherein the curved second end is configured for focusing the light received by the first end; and

means for [securely] holding the first end of the lens [in place with] adjacent to the light-generating source; and

means for protecting the lens from contact

[the substantially flat first end of the lens held facing the light-emitting light-generating source and for protecting the lens from contact].

2. (Amended) An optical device as defined in claim 1, wherein the lens [is composed of a material composition comprising] comprises at least one of glass, aluminum dioxide, sapphire, quartz, acrylic, polyacrylic, polypropylene, and silicone.

3. (Amended) An optical device as defined in claim 1, wherein [the lens comprises an aspheric lens such that] at least a portion of the second end of the lens has [comprises] an aspheric curvature.

4. (Amended) An optical device as defined in claim 3, wherein the aspheric curvature comprises at least one of a hyperbolic curvature, an elliptical curvature, and a parabolic curvature.

5. (Amended) An optical device as defined in claim 1, wherein [the lens comprises a hemispheric lens such that] at least a portion of the second end has a hemispherical curvature.

6. (Amended) An optical device as defined in claim [3] 1, wherein the means for [securely] holding [the lens in place comprises] and the means for protecting comprise a transparent shield that is removably attachable to the dental [device] instrument and which frictionally engages the lens.

7. (Amended) An optical device as defined in claim 6, wherein the transparent shield protects the aspheric lens from making contact with [the] light-curable compounds [and enables] while allowing light [generated at] from the light-generating source to pass [therethrough] through the shield.

8. (Amended) An optical device as defined in claim 7, wherein the transparent shield [is composed of a material composition comprising] comprises at least one of glass, aluminum dioxide, sapphire, quartz, acrylic, polyacrylic, polypropylene, and silicone.

9. (Amended) An optical device as defined in claim 8, wherein the transparent shield comprises a conical [shape] portion having an apex.

10. (Amended) An optical device as defined in claim 9, wherein the second end of the aspheric lens focuses [the] light from the light-generating source into a [predetermined focus] column of [illumination] light having a diameter of about 8 mm at a distance of about 3 mm to about 5 mm from the apex of the transparent shield.

12. (Amended) An optical device for focusing light emitted from a light-generating source of a dental curing instrument, the optical device comprising:

[an aspheric] a lens having a first end that is substantially flat and a second end that is [aspheric] curved, wherein the first end is configured [for receiving] so as to receive light [directly] emitted from the light-generating source, and wherein the second end is configured for focusing the light received by the first end; and

a transparent shield configured [for securely holding] so as to hold the first end of the lens [in place] adjacent to the light-generating source [with the first end held facing the light-emitting source], [wherein] the transparent shield [protects] protecting the [aspheric] lens from contact while enabling light from the light-generating source to pass [therethrough] through the transparent shield.

13. (Amended) An optical device as defined in claim 12, wherein the [aspheric] lens and the transparent shield [are] each [composed of material compositions comprising] comprise at least one of glass, aluminum dioxide, sapphire, quartz, acrylic, polyacrylic, polypropylene, and silicone.

14. (Amended) An optical device as defined in claim 13, wherein the [aspheric] second end of the lens is at least one of [either] hyperbolic, ellipsoidal, and parabolic.

15. (Amended) An optical device as defined in claim 14, wherein the [aspheric] lens focuses the light entering the first end of the aspheric lens into a [focus] column of [illumination comprising] light having a diameter of about 8 mm at a distance of about 3 mm to about 10 mm away from the [aspheric] second end of the [aspheric] lens.

16. (Amended) An optical device as defined in claim 15, wherein the dental instrument [comprises] includes an extension arm and an LED [, and wherein the LED is] attached to [the] an end of [an] the extension arm.

18. (Amended) [An optical device for focusing light emitted from an LED of a dental instrument, the optical device] A light-generating and focusing assembly comprising:  
a light-emitting diode;

[an aspheric] a lens having a first end that is substantially flat and a second end that is [aspheric] curved, wherein the first end is [configured for receiving] positioned so as to receive light [directly emitted] from the [light-generating source] light-emitting diode, and wherein the second end is configured [for focusing the] so as to focus light received [at] by the first end in a desired manner;

[an extension arm that extends away from the dental device and that is configured for securely holding the aspheric lens in a placement with the first end facing the LED;] and

a transparent shield configured [for protecting] so as to protect the [aspheric] lens from physical contact during use and [for allowing] so as to allow light to pass [therethrough] through the transparent shield [, wherein the transparent shield is removably attachable to the extension arm].

19. (Amended) [An optical device] A light-generating and focusing assembly as defined in claim 18, wherein the [aspheric] lens and the transparent shield [are each composed of material compositions comprising] comprise at least one of glass, aluminum dioxide, sapphire, quartz, acrylic, polyacrylic, polypropylene, and silicone.

20. (Amended) [An optical device] A light-generating and focusing assembly as defined in claim [17] 18, wherein at least a portion of the second end of the lens is aspheric [lens] and is at least one of [either] hyperbolic, ellipsoidal, and parabolic.

New claims 21-30 have been added as follows:

21. (New) A light-generating and focusing assembly as defined in claim 18, wherein at least a portion of the second end of the lens is hemispherical.

22. (New) A light-generating and focusing assembly as defined in claim 18, wherein the first end of the lens is positioned adjacent to the light-emitting diode.

23. (New) A light-generating and focusing assembly as defined in claim 22, further including a gap between the lens and light-emitting diode such that they are not in abutting contact.

24. (New) A light-generating and focusing assembly as defined in claim 18, wherein the assembly is attached to an extension arm of a dental light curing apparatus.

25. (New) A light-generating and focusing assembly as defined in claim 24, wherein the lens is removably attached to the extension arm.

26. (New) A light-generating and focusing assembly as defined in claim 24, wherein the transparent shield is removably attached to the extension arm.

27. (New) A light-generating and focusing assembly as defined in claim 24, wherein the lens is attached to the extension arm by the transparent shield.

28. (New) A light-generating and focusing assembly as defined in claim 24, wherein the lens is attached to the extension arm independently of the transparent shield.

29. (New) An optical device as defined in claim 1, wherein the means for holding maintains a gap between the lens and the light-generating source such that they are not in abutting contact.

30. (New) An optical device as defined in claim 12, wherein the transparent shield holds the lens in a manner so as to maintain a gap between the lens and the light-generating source such that they are not in abutting contact.